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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte NAVIN B. SHAH
and
CHARLES P. TARNOSKI,
Appellants

Appeal 2008-3307
Application 10/615,685[1]
Technology Center 1700

Decided: May 27, 2008

Before CAROL A. SPIEGEL, ROMULO H. DELMENDO, and MARK NAGUMO, *Administrative Patent Judges*.

SPIEGEL, *Administrative Patent Judge*.

DECISION ON APPEAL

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[1] Application 10/615,685 ("the 685 application"), filed 9 July 2003, claims priority benefit of the 29 July 2002 filing date of provisional application 60/399,172. The real party in interest is said to be ROHM AND HAAS COMPANY (Amended Appeal Brief under 37 C.F.R. § 41.37(c), filed 11 April 2007 ("Br."), 2).

I. Statement of the Case

This is an appeal under 35 U.S.C. § 134 (2002) from a final rejection of claims 1, 2, and 4-6. Claims 7-10, the only other pending claims, have been withdrawn from consideration (Br. 3; Ans.[2] 2). We have jurisdiction under 35 U.S.C. § 6(b) (2002). We AFFIRM.

The subject matter on appeal relates to coating powder compositions comprising a polyester resin, a semi-crystalline polyester resin, an epoxy-functional curing agent, and a catalyst. Claims 1 and 2 are illustrative and read (Br. 10):

1. A coating powder, comprising:

> a polyester resin composition comprising:
> an amorphous carboxylic acid functional polyester resin in an amount of 75 to 90 parts per hundred parts by weight of the total polyester resin composition, and
> a semi-crystalline polyester resin in an amount of 10 to 25 parts per hundred parts by weight of the total polyester resin composition, wherein the said semicrystalline resin is formed from a polyol and a polycarboxylic acid such that the polycarboxylic acid comprises 10 to 50 phr of the total weight of total polycarboxylic acid used to form the said semi-crystalline polyester is an asymmetrically substituted aromatic polyacid, ester, acid halide, anhydride, or a mixture thereof [sic], and, further, wherein the semi-crystalline polyester resin provides the coating powder with a total cure time of 5 to 20 minutes;
>
> an epoxy-functional curing agent; and
>
> a catalyst.

[2] Examiner's Answer mailed 16 July 2007 ("Ans.").

2. The coating powder of claim 1, wherein the amorphous resin is non-blooming.

The Examiner has rejected (i) claims 1 and 4 under 35 U.S.C. § 103(a) as unpatentable over O'Keeffe[3] and Decker[4] (Ans. 3-4); (ii) claim 2 under 35 U.S.C. § 103(a) as unpatentable over O'Keeffe, Decker, and Ahjopalo[5] (Ans. 4-5); and, (iii) claims 5 and 6 under 35 U.S.C. § 103(a) as unpatentable over O'Keeffe, Decker, and Daly[6] (Ans. 5).

Appellants have separately argued only two claim groupings, i.e., claims 1 and 4-6 and claim 2 (Br. 4-9), and thus have relied on the same arguments for rejections (i) and (iii). Therefore, we decide this appeal on the basis of claims 1 and 2. 37 C.F.R. § 41.37(c)(1)(vii).

II. Opinion

A. Legal standard

A claimed invention is not patentable if it would have been obvious to a person having ordinary skill in the art. 35 U.S.C. § 103(a); *KSR Int'l Co. v. Teleflex, Inc.*, 127 S.Ct. 1727 (2007); *Graham v. John Deere Co.*, 383 U.S. 1 (1966). Facts relevant to a determination of obviousness include (1) the scope and content of the prior art, (2) any differences between the claimed invention and the prior art, (3) the level of skill in the art, and (4) any relevant objective evidence of obviousness or non-obviousness. *KSR*, 127

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[3] U.S. Patent 6,184,311 B1, "Powder Coating Composition of Semi-Crystalline Polyester and Curing Agent," issued 6 February 2001, to O'Keeffe et al. ("O'Keeffe").
[4] U.S. Patent 6,025,030, "Flexible, Weatherable, Acrylic Coating Powder," issued 15 February 2000, to Decker et al. ("Decker").
[5] Ahjopalo et al., "Cyclic oligomers in saturated polyesters," *Polymer,* Vol. 41, pp. 8283-8290 (2000) ("Ahjopalo").
[6] U.S. Patent 6,294,610 B1, "Coating Powders for Heat-Sensitive Substrates," issued 25 September 2001, to Daly et al. ("Daly").

S.Ct. at 1734; *Graham*, 383 U.S. at 17-18. "The combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results." *KSR*, 127 S.Ct. at 1739. All that is required for obviousness under 35 U.S.C. § 103 is a reasonable expectation of success. *In re O'Farrell*, 853 F.2d 894, 904 (Fed. Cir. 1988).

B. Obviousness of claims 1 and 4-6

Findings of fact throughout this decision are supported by a preponderance of the evidence of record.

1. O'Keeffe

O'Keeffe discloses powder coating compositions comprising an amorphous polyester, preferably 60-90 % by weight; a semi-crystalline polyester, preferably 10-40% by weight; an epoxide curing agent; and, a catalyst for the curing reaction (O'Keeffe 2:47-54; 3:1-5; 7:51-56; 8:42-43).

The amorphous polyesters are formed by polycondensation of polyols and polyfunctional carboxylic acids (*id.*, 5:64 through 6:31). "For example, neopentyl glycol and terephthalic acid can be used as basic building blocks of a polyester for use in powder coatings which show hardness or abrasion resistance as key attributes. 1,6-Hexanediol or adipic acid can be chosen as monomers to impart flexibility and/or lower the Tg of a polyester. . ." (*id.*, 6:19-25).

The semi-crystalline polyesters are formed by polycondensation of polyols with polycarboxylic acids or anhydrides, esters, or acid chlorides based on these acids (*id.*, 3:61 through 4:25). Suitable polyols include 1,2-ethanediol, 1,3-propanediol, 1,4-butanediol, diethylene glycol, 1,6-hexanediol, and neopentyl glycol (*id.*, 4:3-11). Suitable polycarboxyic acids

include adipic acid, terephthalic acid, 1,12-dodecanedioic acid, and trimellitic acid (*id.*, 4:11-16).

Exemplified curing times at 200°C include 12, 15, and 20 minutes (*id.*, 14:56; 16:18, 41, and 66-67; 17:27 and 50-51; 18:18 and 65).

2. Decker

Decker discloses coating powders comprising an acrylic resin, a semi-crystalline polyester/curing agent resin, and an additional curative (Decker 1:54 through 2:23). Preferred semi-crystalline polyesters are formed by polycondensation of polyols with polycarboxylic acids or anhydrides, esters, or acid chlorides based on these acids (*id.*, 4:5-12). "To provide the desired flexibility . . . at least about 90 wt % . . . of the polyols used to form the [semi-crystalline] polyester ii) are linear aliphatic diols and at least about 90 wt % . . . of the polycarboxylic acids used to form the polyester ii) are linear aliphatic dicarboxylic acids. However, minor amounts, e.g., up to about 10 wt % of the polyol content and up to 10 wt % of the polycarboxylic acid content, may be other polyols and carboxylic acids, including trifunctional species and those containing cycloaliphatic, aromatic, and unsaturated groups." (*Id.*, 4:12-23; bracketed text added.) Suitable polyols include 1,2-ethanediol, 1,3-propanediol, 1,4-butanediol, diethylene glycol, 1,6-hexanediol, and neopentyl glycol (*id.*, 4:24-34). Suitable polycarboxylic acids include adipic acid, terephthalic acid, 1,12-dodecanedioic acid, and trimellitic acid (*id.*, 4:34-41).

3. Examiner's findings and conclusion

The Examiner found O'Keeffe teaches all the elements of claim 1, including "use of isophthalic acid and trimellitic acid as possible carboxylic acid monomers of the semicrystalline resin", but not use of an

asymmetrically substituted aromatic polyacid in an amount comprising 10 to 50 wt. % of the semi-crystalline resin (Ans. 3). The Examiner found Decker teaches forming a semi-crystalline polyester resin of desired flexiblity by polycondensation of a diol monomer, a dicarboxylic acid monomer, e.g., isophthalic acid, and up to about 10 wt. % of a tricarboxylic acid monomer, e.g., trimellitic acid (Ans. 3-4). The Examiner concluded it would have been obvious to one of ordinary skill in the art to use the semi-crystalline polyester resin of Decker as the semi-crystalline polyester resin of O'Keeffe "in order to tailor the flexibility of the semicrystalline polyester" (Ans. 4).

4. Appellants' arguments

Appellants argue the combination of O'Keeffe and Decker fails to teach or suggest powder compositions comprising a semi-crystalline polyester made from an asymmetrically substituted aromatic polyacid, ester, acid halide, anhydride, or a mixture thereof (Br. 5). Appellants contend Decker teaches coating powders comprising a semi-crystalline polyester have sintering problems without improving impact resistance and flexibility unless the semi-crystalline polyester is prereacted with a curing agent to form an adduct before polymerization with the other components used to make the coating powder (Br. 5). Thus, Appellants further argue Decker teaches use of the adduct, not the semi-crystalline polyester *per se*, to form a coating powder (Br. 5-6). In other words, Appellants argue Decker "unequivocally rejects" using semi-crystalline polyesters *per se* in powder compositions because the resulting coating powders would having sintering problems and inadequate impact resistance (Br. 7).

5. Analysis

We find the Examiner has provided a sufficient basis to support a *prima facie* conclusion of obviousness of claims 1 and 4-6 based on the combined teachings of O'Keeffe and Decker. Both O'Keeffe and Decker expressly disclose trimellitic acid, i.e., 1,3,4-benzenetricarboxylic acid, as a suitable polycarboxylic acid for forming semi-crystalline polyester (O'Keeffe 4:11-16; Decker 4:34-41). Trimellitic acid is an asymmetrically substituted aromatic polyacid (see e.g., Spec. 6:21-22). Furthermore, Decker teaches that powder coatings comprising acrylic resin, semi-crystalline polyester resin and epoxy curing agents have sintering and impact resistance problems unless the semi-crystalline polyester is prereacted with the epoxy curing agent before adding the acrylic resin to the reaction mixture (Decker 1:54 through 2:23). Appellants have not established that polyester-polyester based coating powders have sintering and impact resistance problems like those in acrylic-polyester based coating powders as noted by Decker. Therefore, neither of Appellants' arguments suffices to establish reversible Examiner error. Consequently, we affirm the decision of the Examiner to reject claims 1 and 4-6 under § 103(a) over O'Keeffe and Decker, alone or further in view of Daly.

C. Obviousness of claim 2

Claim 2 requires the amorphous resin used to form the claimed coating powder to be a "non-blooming" resin.

1. Ahjopalo

According to Ahjopalo, "Cyclic dimers of TPA [terephthalic acid] and NPG [neopentyl glycol] are known to migrate to the surface of coatings, causing a phenomenon called 'blooming'" which gives rise "to an undesired

whitish patina" (Ahjopalo 8283, ¶1, bracketed text added). Ahjopalo reports reacting 2-butyl-2-ethyl-1,3-propanediol (BEPD) with terephthalic acid (TPA) results in formation of tetramers (*id.*, 8285, Table 1).

2. Examiner's findings and conclusion

The Examiner found Ahjopalo teaches use of BEPD as a monomer in polyester synthesis decreases formation of cyclic dimers known to cause blooming (Ans. 4). The Examiner concluded it would have been obvious to one of ordinary skill in the art to include BEPD in the amorphous component of O'Keeffe "in order to decrease blooming" (Ans. 5).

3. Appellants' arguments

Appellants argue Ahjopalo's observations are limited to migrations taking place in a bulk polyester, not in a powder and, therefore, one of ordinary skill in the art "would not have expected to successfully make powders non-blooming polyesters in view of Ahjopalo" (Br. 8). Appellants further argue Ahjopalo fails to cure the deficiencies of the O'Keeffe/Decker combination, i.e., to address the sintering and impact resistance problems of Decker's acrylic-polyester based coating powders and to disclose an asymmetrically substituted aromatic polyacid, ester, acid halide, anhydride, or a mixture thereof (Br. 8).

4. Analysis

We find the Examiner has provided a sufficient basis to support a *prima facie* conclusion of obviousness of claim 2 based on the combined teachings of O'Keeffe, Decker, and Ahjopalo. O'Keeffe and Ahjopalo both teach forming polyesters by polycondensation of polyols, such as neopentyl glycol (NPG) and polyfunctional carboxylic acids, such as terephthalic acid (TPA) (O'Keeffe 6:19-23; Ahjopalo 8283, abstract). Appellants have not

pointed to evidentiary support that one of ordinary skill in the art would not have reasonably expected the same products, i.e., cyclic dimers and polyesters, formed during the same reaction, i.e., polycondensation, using the same reagents, i.e., polyols and polyfunctional carboxylic acids, to react differently once they have been formed or to have different glass transition temperatures. (Notably, Ahjopalo states "migration occurs when the polymer coating is exposed to temperatures above its glass transition temperature" (Ahjopalo 8286, ¶2).) Attorney argument, absent evidence, is entitled to little, if any, weight. *Velander v. Garner*, 348 F.3d 1359, 1371 (Fed. Cir. 2003); *Meitzner v. Mindick*, 549 F.2d 775, 782 (CCPA 1977). Finally, we reiterate our analysis of the combined teachings of O'Keeffe and Decker discussed above (§ II.B.5). Since none of Appellants' arguments suffice to establish reversible Examiner error, we affirm the rejection of claim 2 under § 103(a) over O'Keeffe, Decker, and Ahjopalo.

III. Order

Upon consideration of the record, and for the reasons given, it is

ORDERED that the decision of the Examiner rejecting claims 1 and 4 under 35 U.S.C. § 103(a) as unpatentable over O'Keeffe and Decker is AFFIRMED;

FURTHER ORDERED that the decision of the Examiner rejecting claim 2 under 35 U.S.C. § 103(a) as unpatentable over O'Keeffe, Decker, and Ahjopalo is AFFIRMED;

FURTHER ORDERED that the decision of the Examiner rejecting claims 5 and 6 under 35 U.S.C. § 103(a) as unpatentable over O'Keeffe, Decker, and Daly is AFFIRMED; and,

FURTHER ORDERED that no time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a).

AFFIRMED

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